79th RAP Seminar

The 79th Seminar on RIKEN Center for Advanced Photonics

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On-site: **W319, 3F, Cooperation Center, Wako Campus, RIKEN**

Online : **Zoom**

Title: **Scanning electron microscopy for 3D morphological analysis of organelles**

走査電子顕微鏡法 -オルガネラの3D構造解析を目指して-

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Scanning electron microscopy (SEM) yields information about the surface topography of specimens and has been used in biological and biomedical fields to analyze the 3D structure of tissues and cells. Various SEM techniques have been developed by a large number of microscopists. Among these methods, the osmium maceration method is the only technique in which the 3D ultrastructure of membranous organelles—such as the Golgi apparatus, endoplasmic reticulum, and mitochondria—can be observed using SEM without reconstruction. Using this technique, we have mainly observed the 3D ultrastructure of the Golgi apparatus in various types of tissues and revealed the morphological diversity of Golgi cisterns (i.e., cis- and trans-cisterns). However, it has been difficult to reveal the entire 3D shape of the Golgi apparatus by the maceration method because the cracked surface of cells is observed by SEM. To solve the problem, we recently established a novel 3D imaging technique, serial section SEM and 3D reconstruction, which enabled us to elucidate the entire shape of the Golgi apparatus in mammalian cells. Here, I will introduce the 3D structure of the Golgi apparatus imaged by SEM and discuss the use of these techniques for morphological analysis of the Golgi apparatus.

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